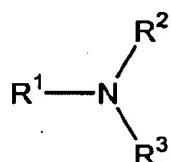


CLAIMS:

WHAT IS CLAIMED IS:

1. A method of enhancing herbicidal activity of a glyphosate herbicide, comprising adding to said glyphosate herbicide a mixture of a first surfactant and a second surfactant at a weight ratio of total surfactant to glyphosate acid equivalent of about 1:30 to about 2:1, wherein said first surfactant has a chemical structure comprising a cationic or protonatable amino group and a C₈₋₂₄ hydrocarbyl group, and said second surfactant has the chemical formula
- R-CO-NR'-(CR'₂)_n-COOM - H₂O*
- where R is a C₇₋₂₃ hydrocarbyl group, n is 1 to 4, M is hydrogen or a cationic counterion, and R' groups are each independently hydrogen, C₁₋₄ alkyl or a group -(CH₂)_m-COOM where m is 1 to 4 and M is as defined immediately above, with the proviso that no more than one R' group is such a group -(CH₂)_m-COOM; the weight ratio of said first surfactant to said second surfactant being about 1:10 to about 10:1.
2. The method of Claim 1 wherein said first surfactant is selected from tertiary alkylamines and alkyletheramines, polyoxyethylene tertiary alkylamines and alkyletheramines, quaternary ammonium surfactants, pyridine and imidazoline surfactants, polyoxyethylene alkylamine and alkyletheramine oxides, alkylbetaines, alkyl diamines and polyoxyethylene alkyl diamines.
3. The method of Claim 1 wherein said first surfactant is a tertiary alkylamine or alkyletheramine surfactant having the chemical formula



where R¹ is a C₈₋₂₄ hydrocarbyl group, optionally interrupted by one or more ether linkages, and R² and R³ are (a) independently C₁₋₄ alkyl groups, or (b) polyoxyalkylene chains having in total 2 to about 100 C₂₋₄ alkylene oxide units.

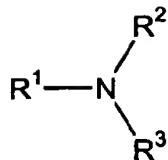
4. The method of Claim 3 wherein R¹ is a C₁₂₋₁₈ hydrocarbyl group and R² and R³ are polyoxyethylene chains having in total 2 to about 100 ethylene oxide units.
5. The method of Claim 1 wherein, in the chemical formula for said second surfactant, the group R-CO- is a C₁₂₋₁₈ linear acyl moiety derived from one or more fatty acids.
6. The method of Claim 1 wherein said second surfactant is an N-(C₁₂₋₁₈ linear acyl) derivative of an α-amino acid.
7. The method of Claim 6 wherein said α-amino acid is selected from alanine, aspartic acid, glutamic acid, glycine, isoleucine, leucine, sarcosine and valine.
8. The method of Claim 6 wherein said α-amino acid is sarcosine.
9. The method of Claim 1 wherein said first surfactant and said second surfactant are present in a weight ratio of about 1:5 to about 5:1.
10. The method of Claim 1 wherein the weight ratio of total surfactant to glyphosate acid equivalent is about 1:10 to about 1:1.
11. The method of Claim 1 wherein the weight ratio of total surfactant to glyphosate acid equivalent is about 1:6 to about 1:2.
12. The method of Claim 1 wherein the glyphosate herbicide is a water-soluble salt of glyphosate with a monovalent counterion.

13. The method of Claim 12 wherein the salt of glyphosate is selected from sodium, potassium, ammonium, C₁₋₁₆ organic ammonium and C₁₋₁₆ organic sulfonium salts.
14. The method of Claim 12 wherein the salt of glyphosate is selected from sodium, potassium, ammonium, dimethylammonium, monoethanolammonium, n-propylammonium, isopropylammonium and trimethylsulfonium salts.
15. A herbicidal composition comprising (a) a glyphosate herbicide; (b) a first surfactant having a chemical structure comprising a cationic or protonatable amino group and a C₈₋₂₄ hydrocarbyl group; and (c) a second surfactant having the chemical formula



where R is a C₇₋₂₃ hydrocarbyl group, n is 1 to 4, M is hydrogen or a cationic counterion, and R' groups are each independently hydrogen, C₁₋₄ alkyl or a group -(CH₂)_m-COOM where m is 1 to 4 and M is as defined immediately above, with the proviso that no more than one R' group is such a group -(CH₂)_m-COOM; the weight ratio of said first surfactant to said second surfactant being about 1:10 to about 10:1, and the weight ratio of total surfactant to glyphosate acid equivalent being about 1:30 to about 2:1.

16. The composition of Claim 15 wherein said first surfactant is selected from tertiary alkylamines and alkyletheramines, polyoxyethylene tertiary alkylamines and alkyletheramines, quaternary ammonium surfactants, pyridine and imidazoline surfactants, polyoxyethylene alkylamine and alkyletheramine oxides, alkylbetaines, alkyl diamines and polyoxyethylene alkyl diamines.
- 5 17. The composition of Claim 15 wherein said first surfactant is a tertiary alkylamine or alkyletheramine surfactant having the chemical formula



where R¹ is a C₈₋₂₄ hydrocarbyl group, optionally interrupted by one or more ether linkages, and R² and R³ are (a) independently C₁₋₄ alkyl groups, or (b) polyoxyalkylene chains having in total 2 to about 100 C₂₋₄ alkylene oxide units.

18. The composition of Claim 17 wherein R¹ is a C₁₂₋₁₈ hydrocarbyl group and R² and R³ are polyoxyethylene chains having in total 2 to about 100 ethylene oxide units.
19. The composition of Claim 15 wherein, in the chemical formula for said second surfactant, the group R-CO- is a C₁₂₋₁₈ linear acyl moiety derived from one or more fatty acids.
20. The composition of Claim 15 wherein said second surfactant is an N-(C₁₂₋₁₈ linear acyl) derivative of an α-amino acid.
21. The composition of Claim 20 wherein said α-amino acid is selected from alanine, aspartic acid, glutamic acid, glycine, isoleucine, leucine, sarcosine and valine.
22. The composition of Claim 20 wherein said α-amino acid is sarcosine.
23. The composition of Claim 15 wherein said first surfactant and said second surfactant are present in a weight ratio of about 1:5 to about 5:1.

- 24. The composition of Claim 15 wherein the weight ratio of total surfactant to glyphosate acid equivalent is about 1:10 to about 1:1.
- 25. The composition of Claim 15 wherein the weight ratio of total surfactant to glyphosate acid equivalent is about 1:6 to about 1:2.
- 26. The composition of Claim 15 wherein the glyphosate herbicide is a water-soluble salt of glyphosate with a monovalent counterion.
- 27. The composition of Claim 26 wherein the salt of glyphosate is selected from sodium, potassium, ammonium, C₁₋₁₆ organic ammonium and C₁₋₁₆ organic sulfonium salts.
- 28. The composition of Claim 26 wherein the salt of glyphosate is selected from sodium, potassium, ammonium, dimethylammonium, monoethanolammonium, n-propylammonium, isopropylammonium and trimethylsulfonium salts.
- 29. The composition of Claim 15 that is a dilute aqueous plant treatment composition having a glyphosate acid equivalent content of about 0.1% to about 10% by weight.
- 30. The composition of Claim 15 that is an aqueous concentrate composition having a glyphosate acid equivalent content of about 10% to about 50% by weight.
- 31. The composition of Claim 15 that is a dry water-soluble or water-dispersible composition having a glyphosate acid equivalent content of about 5% to about 80% by weight.

32. A method of killing or controlling weeds comprising application to foliage of said weeds a composition of Claim 29 in a volume of about 25 to about 1000 l/ha.

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